

**Article title: Association between endogenous sex steroid hormones and insulin-like growth factor proteins in US men**

**Journal name: Cancer Causes and Control**

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Online Resource 1. Associations of sex steroid hormones and IGF-1 (ng/mL) by selected baseline characteristics of the U.S. male population of 20 years or older, NHANES III 1988-1991

Characteristic	Slope†	95% CI	P-trend†	P-interaction‡
<b>Total testosterone, ng/mL</b>				
Age, years				
≤43	0.03	-0.01, 0.08	0.13	
>43	0.03	-0.01, 0.07	0.11	0.90
Race/ethnicity				
Non-Hispanic white	0.03	-0.01, 0.06	0.10	
Non-Hispanic black	0.01	-0.05, 0.06	0.74	
Hispanic	0.08	0.05, 0.11	<0.001	
Other	0.01	-0.16, 0.19	0.88	0.38
Obesity (BMI/waist circumference)				
Not obese/not obese	-0.004	-0.04, 0.03	0.81	
Obese/not obese or not obese/obese	0.14	0.07, 0.22	0.001	
Obese/obese	0.08	0.02, 0.14	0.02	0.03
Diabetes				
No	0.001	-0.04, 0.04	0.94	
Pre-diabetes	0.04	-0.01, 0.09	0.13	
Yes	0.09	-0.01, 0.18	0.06	0.10
<b>Free testosterone, ng/mL</b>				
Age, years				
≤43	0.03	-0.02, 0.08	0.24	
>43	0.02	-0.04, 0.07	0.55	0.49
Race/ethnicity				
Non-Hispanic white	0.02	-0.02, 0.06	0.41	
Non-Hispanic black	-0.01	-0.09, 0.06	0.70	
Hispanic	0.07	0.03, 0.11	0.002	
Other	-0.01	-0.13, 0.13	0.98	0.67
Obesity (BMI/waist circumference)				
Not obese/not obese	-0.01	-0.06, 0.03	0.57	
Obese/not obese or not obese/obese	0.17	0.07, 0.26	0.001	
Obese/obese	0.06	0.002, 0.11	0.04	0.07
Diabetes				
No	-0.005	-0.05, 0.04	0.82	
Pre-diabetes	0.03	-0.20, 0.08	0.22	
Yes	0.07	-0.04, 0.18	0.19	0.30
<b>Total estradiol, pg/mL</b>				
Age, years				
≤43	-0.02	-0.05, 0.01	0.26	
>43	-0.02	-0.07, 0.02	0.24	0.36
Race/ethnicity				
Non-Hispanic white	-0.02	-0.05, 0.01	0.14	
Non-Hispanic black	0.003	-0.05, 0.06	0.91	
Hispanic	-0.01	-0.05, 0.04	0.76	
Other	-0.01	-0.07, 0.05	0.75	0.21
Obesity (BMI/waist circumference)				

Not obese/not obese	0.003	-0.02, 0.03	0.80	
Obese/not obese or not obese/obese	-0.09	-0.17, -0.02	0.01	
Obese/obese	-0.04	-0.10, 0.02	0.19	0.30
Diabetes				
No	-0.01	-0.04, 0.02	0.38	
Pre-diabetes	-0.02	-0.06, 0.01	0.22	
Yes	0.03	-0.04, 0.10	0.44	0.44

#### Free estradiol, pg/mL

Age, years				
≤43	-0.01	-0.04, 0.02	0.57	
>43	-0.02	-0.07, 0.03	0.52	0.45
Race/ethnicity				
Non-Hispanic white	-0.01	-0.05, 0.01	0.29	
Non-Hispanic black	0.01	-0.05, 0.07	0.77	
Hispanic	-0.01	-0.04, 0.03	0.64	
Other	0.03	-0.07, 0.13	0.50	0.15
Obesity (BMI/waist circumference)				
Not obese/not obese	0.01	-0.02, 0.03	0.63	
Obese/not obese or not obese/obese	-0.09	-0.16, -0.02	0.01	
Obese/obese	-0.02	-0.08, 0.04	0.56	0.73
Diabetes				
No	-0.01	-0.04, 0.02	0.69	
Pre-diabetes	-0.02	-0.06, 0.02	0.26	
Yes	0.05	-0.03, 0.14	0.21	0.47

#### SHBG, nmol/L

Age, years				
≤43	-0.06	-0.09, -0.02	0.004	
>43	-0.01	-0.07, 0.06	0.86	0.29
Race/ethnicity				
Non-Hispanic white	-0.01	-0.05, 0.04	0.78	
Non-Hispanic black	-0.07	-0.12, -0.03	0.002	
Hispanic	-0.06	-0.09, -0.03	<0.001	
Other	-0.03	-0.16, 0.10	0.61	0.04
Obesity (BMI/waist circumference)				
Not obese/not obese	0.006	-0.04, 0.05	0.79	
Obese/not obese or not obese/obese	-0.05	-0.17, 0.07	0.43	
Obese/obese	-0.09	-0.15, -0.03	0.005	0.39
Diabetes				
No	-0.002	-0.05, 0.04	0.92	
Pre-diabetes	-0.02	-0.07, 0.04	0.55	
Yes	-0.10	-0.17, -0.04	0.003	0.98

#### Androstanediol glucuronide, ng/mL

Age, years				
≤43	-0.004	-0.03, 0.02	0.71	
>43	0.01	-0.01, 0.04	0.22	0.28
Race/ethnicity				
Non-Hispanic white	-0.002	-0.03, 0.02	0.87	

Non-Hispanic black	-0.01	-0.06, 0.04	0.60	
Hispanic	0.04	-0.01, 0.08	0.08	
Other	0.06	-0.03, 0.14	0.20	0.44
Obesity (BMI/waist circumference)				
Not obese/not obese	-0.01	-0.04, 0.02	0.55	
Obese/not obese or not obese/obese	0.01	-0.03, 0.06	0.54	
Obese/obese	0.04	0.01, 0.08	0.02	0.18
Diabetes				
No	-0.003	-0.03, 0.02	0.78	
Pre-diabetes	0.001	-0.03, 0.03	0.94	
Yes	0.05	-0.02, 0.13	0.12	0.85

Abbreviations: BMI, body mass index; SHBG, sex hormone binding globulin

† From a weighted linear regression model per 1 quintile change in sex steroid hormones on IGF-1 adjusted for age, race/ethnicity, body mass index, waist circumference, diabetes, alcohol consumption, cigarette smoking, physical activity, plus testosterone, estradiol, and SHBG mutually adjusted, and free testosterone and free estradiol mutually adjusted

‡ P-interaction for the coefficient of the product of the ordinal variables for sex steroid hormones, with age (dichotomized at the median of 43 years), race/ethnicity, obesity (using  $BMI \geq 30 \text{ kg/m}^2$  and waist circumference  $\geq 102 \text{ cm}$ ), and diabetes